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AN EVALUATION OF THE APPLICATION OF E-LOGISTICS IN ORGANIZATIONS

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ABSTRACT

The purpose of the study is to provide a better understanding of how organizations utilize e-logistics within their supply chain. Two questions will be examined, (1) How can the e-Logistics system be described and (2) What the factors that influence the e-logistics system. The e-Logistics system can be described as a process and as an information system. Factors then include reliability factors, maintainability factors, supply support factors, test and support equipment factors, organizational factors, facility, transportation, and handling factors, software factors, availability factors, and economic and effectiveness factors. These factors, however, deserves further research.

Keywords

Supply chain, supply chain management, Logistics, e-Logistics, Business-to-Business, Business-to-Consumer.

1.0 INTRODUCTION

Supply chain is a network of suppliers, manufacturing plants, warehouses, and distribution channels organized to acquire raw materials, convert these raw materials to finished products, and distribute these products to customers. The concept of the supply chain or value chain has emerged to support the integration of logistics activities, which include purchasing, manufacturing, distribution, and sales (Sudalaimuthu & Raj, 2009). Each element in the supply chain can be affected by inaccurate demand information, disturbance due to breakdown, the number of decision points where information is concentrated and acted on, time lags for value and non-value-added processes, and decision rules for activities such as inventory levels or order placement.

Supply chain management that is now seen as a governing element in strategy and as effective way of creating value for customers has generated a substantial amount of interest among both managers and researchers. According to Bardi, Coyle & Noyack (2006), supply chain management integrated product, information, and cash flows among organizations from the point of origin to the point of consumption, with the goal of maximizing consumption satisfaction and minimizing organization costs. It is broader than logistics and includes all activities involved in the sourcing, manufacturing or conversion, storage, distribution, and delivery of goods to customers.

Logistics is defined as the broad range of activities concerned with effective and efficient movement of semi-finished or finished goods from one business to another and from manufacturers to the end consumers. The activities include freight transportation, warehousing, material handling, protective packaging, inventory control, order processing, marketing, forecasting, and customer service.

E-Logistics can be defined as processes necessary to transfer the goods sold over the Internet to the customers. In other aspect is that e-logistics is wide-ranging topic related to supply chain integration that has effect of eliminating intermediaries such as wholesaler and also fosters the emergence of new players like logisticians. E-Logistics also can means doing e-business inside of Transport Logistics Cluster (TLC) between companies (Business-to-Business) and outside of it between TLC and customers (Business-to-Consumer) over the Internet. The area of B2B logistics is very important and is gain divided into two distinct categories: Inbound logistics and outbound logistics. Inbound logistics refers to the management of material movement and integration from component suppliers to a manufacturer or assembler while outbound logistics is the management of movement of final products from a manufacturer or assembler to the distributors and retailers.

Nowadays, e-logistics has become important for different reasons. Gunasekaran, Ngai, and Cheng (2006) found that e-logistics is a logistics community network consisting of third-party logistics service providers including warehousing and transportation networks with suitable information technologies (e.g. Electronic Data Interchange, the Internet, wireless and mobile communication technologies, WWW and Radio Frequency Identification (RFID)) with the objective of providing one-stop value-added services to customers. Traditional supply chain and trading partner relationships are exploding into complicated and change constantly in networks of trading partners and service providers. The emphasis in these relationships is to derive significant value through increased revenues and decreased costs. It is directly depends on the performance of all the organization in the network and their willingness and ability to coordinate to achieve it. The objective of the research is to provide clear understanding of e-logistics system and factors that influence e-logistics in organizations. The lack of knowledge will increase the failure in e-commerce business (Bayles, 2002).

2.0 LITERATURE REVIEW

According to Bayles (2001), Logistics systems are a collection of data, hardware, software, and rules that work together to support an activity. Electronic commerce has revolutionized not only the way goods are sold, but how they are delivered. The tenets of one-to-one marketing that online firms are adopting must be carried over to their fulfillment operations, and this is creating mass-scale chaos. E-Logistics is created to harness the power of web technology to bring new efficiency to freight transport operators. It support the way transport operations actually work, and completes the entire transport management cycle of forecast, plan, delivery, post delivery and reporting. Whilst other systems may do parts of this better no other system provides management of the entire process and enables colleagues and business partners to work together collaboratively, streamlining work-flow and reducing administration. To fit on critical study, the e-logistics can be described by process and information system.

2.1 The Process of e-Logistics

According to Zhang, Yadav & Chang (2001), the typical e-logistics include Request For Quotes (RFQ), Shipping, and Tracking as shown in figure 1.

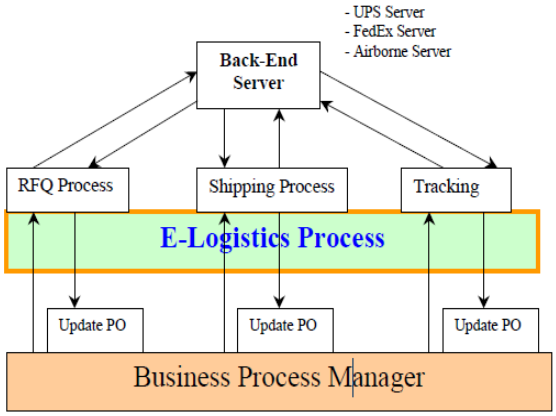

Figure 1: High-Level View of E-Logistics Processes Integration Framework (ELPIF)

The RFQ process is done by the business process manager in order to get the basic services such as getting the quotes in an e-logistics process. The purchase order (PO) is updated, whenever the response is obtained. Shipping process is also apply by the business process manager and upon completion updates the PO. Once goods are shipped, the tracking number is given to the customer and that tracking number is mapped to the PO number in an e-logistics system. Customers can track their shipment with the help of that number.

2.2 Logistics Information System

According to Closs (1994) cited by Robeson and Copacino (1994), logistics information systems is combine with hardware (include computers, input and output devices, communication channels, ancillary technology like bar code and radio frequency devices, and storage media) and software (include system and application programs used for logistics activities) to manage, control, and measure logistics activities.

Logistics information systems include two flows that incorporate coordinating and operational activities (Closs, 1994). Figure 2 illustrates the key activities within each plane. Coordinating activities include scheduling and requirements planning throughout the firm. Typical activities are the development of strategic, capacity, logistics, manufacturing, and procurement plans. While operational activities are the information procedures that initiate and track receipts, inventory assignment, and shipment of replenishment and customer orders. Replenishment orders control finished goods inventory movement between distribution facilities.

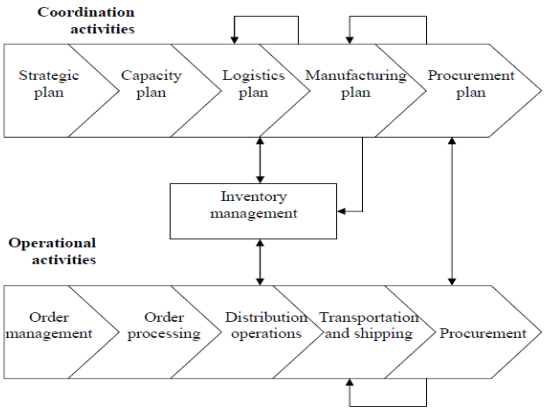

Figure 2: Logistics Information Flow

2.3 Relationship between Traditional Logistics and Commerce Site Logistics (e-logistics)

According to Bayles (2001), the characteristics of traditional logistics and commerce site logistics can be vastly differing as shown in Figure 3.

	Traditional Logistics	Commerce Site Logistics
Shipment Type	Bulk	Parcel
Customer	Strategic	Unknown
Demand Style	Push	Pull
Inventory/ Order Flow	Unidirectional	Bidirectional
Average order amount	More than $1000	Less than $100
Destinations	Concentrated	Highly dispersed
Demand	Stable, Consistent	Highly seasonal, fragmented
Accountability	One link	Through the entire supply chain

Figure 3: Commerce Site Logistics Differ from Traditional Logistics

As what had show in Figure 3, there are the foundation of the complete shift we are seeing in the e-logistics landscape. Opportunities are arising all along the e-logistics continuum because there is better service provided to customers compare with traditional logistics service, no matter with the customers is another business or a consumer. Another opportunity is reducing costs and time as enterprise internal processes are faster completed by e-logistics application. Those company are utilizing e-logistics system is more efficiency and effectiveness compared with those companies that still using the traditional logistics method.

3.0 Proposed Framework

According to Silverman (2000) cited by Wang & Chen (2006), the theoretical framework is built from a set of concepts linked to existing methods, behaviors, functions, relationships and objects.

The discussion of factors that influence the e-logistics system will be mainly applied to our research. There are reliability factors, maintainability factors, supply support factors, test and support equipment factors, organizational factors, facility, transportation, and handling factors, software factors, availability factors, and economic factors, and effectiveness factors which is shown in Figure 4.

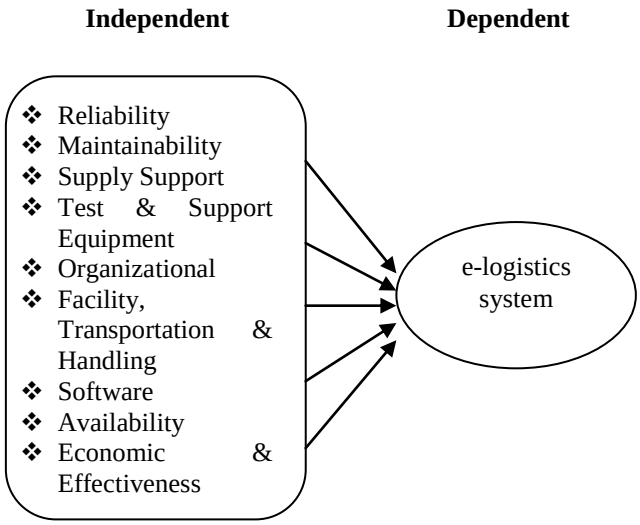

Figure 4: Theoretical Framework

Figure 4 shows the reliability factors, maintainability factors, supply support factors, test and support equipment factors, organizational factors, facility, transportation, and handling factors, software factors, availability factors, and economic factors and effectiveness factors are independent variables while the dependent variable are e-logistics system.

Reliability is the probability that an item will perform its intended function for a specified interval in a stated condition. The frequency of maintenance for a given item is highly dependent on the reliability of that item. For maintainability factors, it is an inherent design characteristic dealing with the ease, accuracy, safety,

and economy in the performance of maintenance functions. It can be influenced in terms of a combination of elapsed times, personnel labor-hour rates, maintenance frequencies, maintenance cost, and related logistics support factors.

Supply support include all management procedures and techniques used to acquire, catalogue, receive, store, transfer, issue and dispose of all secondary items, including for provisioning for initial support. Supply support also includes the spare parts and the associated inventories necessary for the accomplishment of unscheduled and scheduled maintenance actions. The general category of test and support equipment factors may include precision electronic test equipment, mechanical test equipment, ground handling equipment, maintenance stands, and so on. These items may be assigned to different maintenance locations

The influences of organization factors are basically same as those factors which are typical for any organization. The particular interest relative to logistics support are the direct maintenance labor time for each personnel category, overhead factor, personnel turnover rate, personnel training rate and so on. The right personnel quantities and skills must be available when required, and the individuals assigned to the job must be properly trained and motivated. For the facility, transportation, and handling factors, facilities is include the planning, acquisition and management of permanent or semi-permanent real-estate and property assets required to support the system while transportation requirements include the movement of human and material resources between the sources of supply and the various locations where maintenance activities are accomplished. While transportation and handling factors are regard to the design of a system for transportability or mobility. Transportation requirements must be defined and the system must be designed such that the required transportation and handling activities can be accomplished both effectively and efficiently.

For many systems, software has become a major element of support. Although software does not degrade in the same way as equipment, the reliability of software is still important and must be influenced. In the availability factors, the term is often used as an influence of system readiness such as the degree, percent or available when required for use. Availability may be expressed differently, depending on the system and its mission.

In recent years, the economic trend has created an awareness and interest in total system cost. Not only are the acquisition costs associated with new system rising, but the cost of operating and maintaining systems already in use are increasing at alarming rates. The net result is that less money is available to meet new requirements, as well as maintaining systems that are already in being. The effectiveness must consider the system performance and physical parameters (e.g. capacity, delivery rate, accuracy, volume, speed, weight and so on), system operational and support factors (availability, capability, reliability and so on) and total life-cycle cost (e.g. research and development cost, production cost, operation and maintenance cost and so on).

5.0 DISCUSSION & CONCLUSION

From the study, it can conclude that e-logistics can be described from process and information system. The process of e-logistics can be described from three sub-processes, which are Request For Quotes (RFQ), Shipping Process and Tracking Process. Besides, the company's e-logistics system are differs depending on the experience the company has and the developing level of their e-logistics system.

Moreover, reliability factors, maintainability factors, supply support factors, test and support equipment factors, organizational factors, facility, transportation and handling factors, software factors, availability factors, and economic and effectiveness factors are act as key role when we consider the factors that influence the e-logistics system. The same factors have different level of impact to different kinds of companies.

Finally, this study was provides an insight of e-logistics system for organizations which stay in different level of development and some factors that influence the e-logistics system. It will become more interesting to investigate deeply about the different of this study. Nowadays, e-logistics are widely used in big companies. E-logistics system should be used in small companies widely too to increased their efficiency and effectiveness in logistics process. The system of e-logistics not only reduced the costs of expense in transportations, it's also reduced the time of procedures of shipment. Those companies which still using the traditional logistics should be change over to e-logistics system to become more competence between logistics companies.

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